ISC Baselining
Branch-Level Questionnaire

Name _____   Date _____
      Branch Name _____   Position/Title
_____
      Telephone Number (____) _____   Email address
_____

      While accuracy is important, please don't spend a lot of time searching through personnel or other records. If you are guessing, just say so in the margin for that question. Your best estimates are probably adequate for our purposes. If you don't know an answer, just leave it blank. If an area doesn't apply to the types of work your Branch does, mark it "N/A" or write "None".

      When you fill in this questionnaire, if you are not clear on the meaning of a term in a question, please leave it blank and ask your SEL representative during the follow-up interview. Unless the question says differently, your answers should encompass both your civil servants and your directly supporting contractors including subcontractors.

      1.   **Overall Characteristics**

    a)   What is the size of your Branch?
        Number of Full time equivalents (FTEs): _____ in-house _____ Contractors

b)   What are the application domains of the work in your Branch?
                  _____
                  _____
    _____

    c)   What software projects are worked on in your branch?
        (Please indicate if you have overall responsibility for that software project)

project name	*is branch responsible?*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*
_____	*Yes_____ No_____*

[In-house personnel assigned to software tasks are those involved 50% or more of their time in requirements, design,
coding, testing, documenting, performing software quality assurance, conducting configuration control over the software,
performing IV&V, and/or doing any aspect of software testing. Software personnel also encompasses up
to and including the 2nd tier management responsible for the Team. "Software personnel" does not include staff
providing computer center resources or other people with only peripheral involvement.]

    d)   How many in-house people in your Branch are working software tasks? _____ FTEs

    e)   How many contractor people in your Branch are working software tasks? _____ FTEs

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[All questions beyond this point relate to software personnel or software work.]

f) Do you have people in your branch matrixed to projects elsewhere **within**
ISC? *Yes_____ No_____*

If yes, what percent are matrixed _____% FTEs

g) Do you have people in your branch matrixed to projects **outside the ISC**?
Yes_____ No_____

If yes, what percent are matrixed _____% FTEs

h) What percent of the work in your branch is currently contracted? _____*% of budget contracted*

i) List the companies which are the main contractors serving your branch:

_____
_____
_____
_____
_____
_____
_____

j) Do you have any work contracted out to another code? *Yes_____ No_____*
If yes, please specify GSFC CODE

_____
_____
_____

[Note: Software development is defined to begin at the start of writing down software requirements. We define
"software maintenance" as all activities that take place from the time of the first operational use of the first version
of the software. That means software maintenance includes all fixing, enhancing, new versions, adapting, and
changing that takes place after IOC regardless of how small or big the maintenance activity is.]

k) What percent of effort is spent on the following:
Development _____% *Maintenance _____%* *Other*
_____*%.*

(*please specify*
_____)

For questions l-q, Answer for the major domains in your branch. If there are significant
differences among domains discuss this with your SEL representative at the follow-up interview. The sum of
all activities should total 100% for each domain.

l)* What is the approximate allocation of effort of your Branch's <u>software development</u> (i.e., not
maintenance) activities to the following activities? *(The sum of all activities should total 100%)*

Reqts/Analysis _____% *Design _____%* *Coding _____%* *Testing _____%* *Other _____%*
(*please specify*
_____)

m) Indicate the distribution of the branch personnel among the following roles:
(The sum of all activities should total 100%)

System Engineers _____% *Programmers _____%* *Analysts _____%* *Testers _____%*

Tech Leads _____% *QA/CM _____%* *Managers _____%* *Other _____%* (please
specify_____)

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n)*   What percentage of your software development budget is typically spent on:
        (The sum of all activities should total 100%)

        QA _____%   Configuration Management _____%   Documenting ____ % Managing _____%

o)*   What was the approximate allocation of your Branch's maintenance activities to the following activities?
        (The sum of all activities should total 100%)

        Reqts/Analysis ____%   *Design* ____%   *Coding* ____%   *Testing* ____%   *Other* ____%

                                                                                (*please specify* _____)

p)*   What percentage of your maintenance budget is typically spent on:
(The sum of all activities should total 100%)

        QA _____%   *Configuration Management* _____%   *Documenting* ____ %   *Managing* _____%

q)*   What was the approximate allocation of that <u>maintenance</u> amount for:
(The sum of all activities should total 100%)

        Correcting _____%   *Enhancing* _____%   *Adapting* _____ %   *Testing/Verifying* _____ %

r)   Is your Branch currently doing any software engineering research?   *Yes*____ *No*____
                If yes:
            1) what is the number of people currently involved in research
                    (in-house & contractor) that is budgeted? _____ FTEs
            2) identify the technology being researched _____

2.   How Much Software Do You Have?

a)   Approximately how many lines of code are <u>operationally available</u> (software you are responsible for maintaining) in your Branch in each of the following categories and what is the usual lifetime of the software in each category?

        *[By software "lifetime", we mean the time from first operational use of the first version of the software to the end
of the last version's operational application.]*

Category	*LinesofCode*	*#Active*	*SoftwareLifetime*	[Use Check or %]		
	Project	*<2yrs*	*2-4yrs*	*4-7yrs*	*>7yrs*	
Embedded	_____	_____	_____	_____	_____	
On-board Data Handling		_____	_____	_____	_____	_____
Mission Ground Support	_____	_____	_____	_____	_____	
Information Mgmt Support		_____	_____	_____	_____	_____
General Support		_____	_____	_____	_____	_____
Off-line Data Systems		_____	_____	_____	_____	_____
Science Processing		_____	_____	_____	_____	_____
Administrative	_____	_____	_____	_____	_____	
Research		_____	_____	_____	_____	_____

        Your use of "Lines of Code" (check one):   Total physical lines _____
                Executable lines only   _____
                Total non-comment lines   _____
                Other lines   _____

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3.   People Characteristics

a)   What is the average number of days per year software personnel in your Branch spend in software-related   training?

_____ Days For in-house People   _____ Days For Contractor People

["Software personnel" are defined as all personnel involved 50% or more of their time in requirements, design,
coding, testing, documenting, performing software quality assurance, conducting configuration control over the
software, performing IV&V, and/or doing any aspect of software testing. "Software personnel" also encompass
up to and including the 2nd tier management responsible for the Team. "Software personnel" do not include
staff providing computer center resources (e.g., tape mounters) or other people involved only peripherally with
the software.]

b)   Does your Branch participate in a Software Training Program? *Yes_____ No_____*

[By Software Training Program, we mean a reasonably integrated set of related courses offered on a regular basis
designed to maintain and improve the skills necessary to develop, manage, assure, and deliver quality software
using modern, proven techniques.]

c)   Do your contractor organizations participate in a Software Training Program?
All do _____   Most do _____ Few do _____

d)   Is there a recommended software training program for the key software positions?

In-house   *Yes_____ No_____*
Contractor   *Yes_____ No_____*

[A recommended software training program would mean that combinations of training and experience would
be key criteria in the staffing of your software Teams. We define "key software positions" as those such as
Software Team Manager, Systems Analyst, Requirements Engineer, Integration & Test Manager, Software
Configuration Manager, and Software Quality Assurance Manager.]

e)   What percent of your Branch's <u>software staff</u> have college degrees applicable to software development?

% of Civil Servants % of Contractors

	% of Civil Servants	% of Contractors
Computer Science or Related	_____%OBEs	_____%OBEs
Other Technical [physics, engineering...]	_____%OBEs	_____%OBEs
Non-Technical Degree or No Degree	_____%OBEs	_____%OBEs

f)   What percent of your software team management falls into the following ranges of software management experience? *[Note: S/W mgmt experience for any size s/w Team. Consider OBEs not FTEs]*

in-house Team Managers   <3 yrs   ____%   3-5 yrs _____ % 5-10 yrs ___% > 10 yrs ___%
Contractor Team Managers   <3 yrs   ____%   3-5 yrs _____ % 5-10 yrs ___% > 10 yrs ___%

g)   How would you rate present software training activities from the standpoint of usefulness and applicability to your Branch's software work? (1 = not helpful; 5 = very helpful)

Available to in-house personnel   Rating   _____
Available to contractor personnel   Rating   _____

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4. **Software Processes Used for Developing and Maintaining Software**

["Software process" means the phases, activities, and products by which the software is defined, developed,
documented, and delivered. Such a process would include policies and standards, formal and informal reviews, and collection, analysis, and use of metrics.]

a) What percentage of your Branch (including contractors) uses defined, written, advocated software processes? _____%

b) To what extent are these software processes used? (Check one)
Minimal use _____ Some use _____ Extensive use _____

c) How helpful are the software processes? (Check one)
Minimally helpful _____ Somewhat helpful _____ Very helpful _____

d) To what degree are these software processes enforced? (Check one)
Minimally enforced _____ Somewhat enforced _____ Rigorously enforced _____

e) Where are your software processes documented, and who owns them?
_____
_____
_____

f) What percentage of your Branch (including contractors) use software standards? _____%

g) To what extent are these standards used? (Check one)
Minimal use _____ Some use _____ Extensive use _____

h) How helpful are the standards? (Check one)
Minimally helpful _____ Somewhat helpful _____ Very helpful _____

i) To what degree are these standards enforced? (Check one)
Minimally enforced _____ Somewhat enforced _____ Rigorously enforced _____

j) What standards are used in your branch? NASA or other standards (e.g. ANSI, IEEE, ISO)
_____
_____
_____

k) Where are your software standards documented, and who owns them?
_____
_____
_____

l) Does your branch use Commercial Off-the-Shelf (COTS) products as components of deliverable systems   (embedded COTS)?
Yes_____ No_____
If yes, please specify
_____
_____
_____

m) Does your branch use COTS products to support software development and maintenance (that must be   delivered with a system)?
Yes_____ No_____
If yes, please specify
_____
_____
_____

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n)   Does your branch use COTS products to support software that is **NOT** delivered with system
Yes_____ No_____

If yes, please specify

_____

_____

_____

o)   What languages is your Branch using for new software presently under development?
Fortran _____% Cobol ____% C____% C++ ____% Ada ____% 4GL____%
Other (specify): _____   ____%
 _____   ____%
 _____   ____%

p)   What percent of your Branch's **existing** software is written in the following languages?
Fortran _____% Cobol ____% C____% C++ ____% Ada ____% 4GL____%
Other (specify): _____   ____%
 _____   ____%
 _____   ____%

q)   What are the major testing techniques used in your Branch?

_____

_____

_____

Are forms used to record test results?   *Yes_____ No_____*
Is there training for testing?   *Yes_____ No_____*
Is data archived?   *Yes_____ No_____*

r)   What are the key documents produced and used by your process?

_____

_____

_____

s)   What other non-software deliverables are produced and used by your process?

_____

_____

_____

t)   Are Project Plans typically used by the projects run by your branch?   *Yes_____ No_____*
[Note: "Project Plans" include Management and/or Development Plans]

If yes are the plans: (check the one that applies)
Kept Current & Followed___ Followed but NOT maintained___ NOT Followed NOR Maintained ___

u)   What types of tools are routinely applied by your Branch's software development Teams? (Use check marks)

Requirements Analysis   _____   Traceability   _____   Design/Graphics   _____
Documentation   _____   Debuggers   _____   Test Data Generators   _____
Test Coverage   _____   QA Checkers   _____   CM Aids _____
Complexity Measuring   _____

Other Types (please list): _____

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v)   What is the knowledge and usage in your Branch of the following:

	---- Awareness ----			---- Training ----			---- Usage ----		
	Minimal	*Some*	*Much*	*Minimal*	*Some*	*Much*	*Minimal*	*Some*	*Much*
Prototyping	____	____	____	____	____	____	____	____	____
Object-Oriented Technology	____	____	____	____	____	____	____	____	____
Inspections/Walkthroughs	____	____	____	____	____	____	____	____	____
Cleanroom Techniques	____	____	____	____	____	____	____	____	____
Formal Methods	____	____	____	____	____	____	____	____	____
CASE tools	____	____	____	____	____	____	____	____	____
Structured Analysis	____	____	____	____	____	____	____	____	____
Information Hiding	____	____	____	____	____	____	____	____	____
COTS Integration	____	____	____	____	____	____	____	____	____
Reliability Modeling	____	____	____	____	____	____	____	____	____
Defect Causal Analysis	____	____	____	____	____	____	____	____	____

w)   Please respond concerning types of software metrics used in your Branch. *[Software "measures" and software*
"metrics" are interchangeable terms.] Possible answers are: 1) Never, 2) Some, or 3) Routinely.

Type	Data Collected?	Feedback Analyzed?	to Team?	Archived in a Database?
Resource (effort, computer use...)	_____	_____	_____	_____
Defects (errors and their causes...)	_____	_____	_____	
Product (code size, pages of documentation...)	_____	_____	_____	_____
Process (extent of training, records of reviews...)	_____	_____	_____	_____
Productivity (Volume of work per unit of time, eg,SLOC per staff years)	_____	_____	_____	_____
Project characteristics (language, platform)	_____	_____	_____	
Modifications (effort, reason, application domain, Team experience.)	_____	_____	_____	_____

x) List the software measures that are collected by your branch:

_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____

y)   At the start of preliminary design, are the software requirements typically stable and well understood?

_____*Very stable*   _____*Fairly stable*   _____ *Unstable*

z)   Are requirements placed under rigorous, well-defined change control? *Yes____ No____*
If yes, when? _____ SRR? _____ PDR? _____ CDR? _____ Other (list)_____

aa)   Is change control discipline **maintained** according to known, **written** rules from SRR throughout
the remainder of the software's life?   *Yes____ No____*

bb)   After CDR, do software projects usually experience substantial (>25%) redesign?
Yes____ No____

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5.   PRODUCT CHARACTERISTICS

a) What types of software products are developed and maintained in your Branch?

(Check all that apply)

Embedded _____
On-board Data Handling _____
Mission Ground Support _____
Information Mgmt Support _____
General Support _____
Off-line Data Systems _____
Science Processing _____
Administrative _____
Research _____
Other (please specify) _____ _____
_____
_____

b) What is the defect rate in your operational software?
Number of Errors/kSLOC

Minimum Defect Rate _____
Average Defect Rate _____
Maximum Defect Rate _____

[Note: kSLOCs are defined as the sum of all physical lines; i.e., executable, non-executable, and commentary.]

c) What are typical causes of errors in your Branch's operational software?
(Please rank most to least significant, 1 = most significant)

Misinterpreted Requirements _____
ChangingRequirements _____
MissingRequirements _____
DesignErrors _____
Interfaces _____
CodingErrors _____
EnvironmentProblems _____

Thank you for taking the time to work on this questionnaire.

Now that you have gone through all the questions, please contact your SEL representative to confirm that you are ready for your follow-up interview.
If you are not sure who your SEL representative is, contact Amy Parra at 301.794.1298 or aparra@cscmail.csc.com.

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